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# Basin Outlook Reports

## and Federal - State - Private Cooperative Snow Surveys

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### *How forecasts are made*

Most of the annual streamflow in the Western United States originates as snowfall that has accumulated high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are combined with snowpack data to prepare runoff forecasts. Streamflow forecasts are coordinated by Soil Conservation Service and National Weather Service hydrologists. This report presents a comprehensive picture of water supply conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data, and narratives describing current conditions.

Snowpack data are obtained by using a combination of manual and automated SNOTEL measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation and temperature are monitored on a daily basis and transmitted via meteor burst telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

Forecast uncertainty originates from two sources: (1) uncertainty of future hydrologic and climatic conditions, and (2) error in the forecasting procedure. To express the uncertainty in the most probable forecast, four additional forecasts are provided. The actual streamflow can be expected to exceed the most probable forecast 50% of the time. Similarly, the actual streamflow volume can be expected to exceed the 90% forecast volume 90% of the time. The same is true for the 70%, 30%, and 10% forecasts. Generally, the 90% and 70% forecasts reflect drier than normal hydrologic and climatic conditions; the 30% and 10% forecasts reflect wetter than normal conditions. As the forecast season progresses, a greater portion of the future hydrologic and climatic uncertainty will become known and the additional forecasts will move closer to the most probable forecast.

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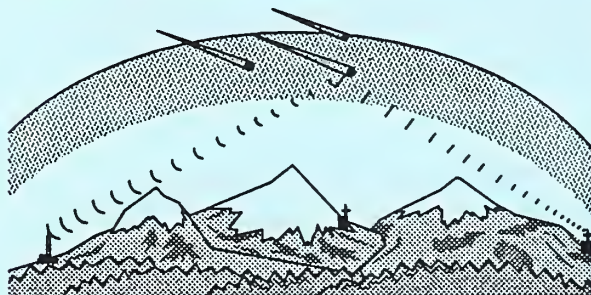
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In addition to basin outlook reports, a Water Supply Forecast for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 248, Portland, OR 97209-3489.

# Basin Outlook Reports

May 1, 1992



United States  
Department of  
Agriculture

Soil  
Conservation  
Service



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# WASHINGTON WATER SUPPLY OUTLOOK

MAY 1992



## GENERAL OUTLOOK:

WASHINGTON Water Supply Outlook Report as of May 1, 1992: Above normal temperatures, below normal snowpack. Sounds like a broken record. It may be tourist weather but its hard on the water supplies. April, unlike the previous months this year, had above normal precipitation with 149% of normal statewide. It varied from 32% of average in the Okanogan Basin to 192% in the olympic Basin. Year-to-date precipitation varies from 67% in the Okanogan to 100% in the Walla Walla Basin. Temperatures varied from four degrees above in the Seattle area to one degree above in the Yakima Basin. Low elevation snowpack is gone, with snow remaining only above the 3500 foot elevation. The snowpack varies from 3% of normal in the Elwah River Basin to 89% in the Chelan Basin. Washington's SNOTEL sites were averaging 45% of normal snowpack on May 1 (by May 7, it was 40%), down from 62% a month ago. Forecasts for 1992 runoff vary from 87% of average for the Skagit River to 29% for the Grande Ronde River in Walla Walla Basin. April streamflows varied from 35% of normal on the Walla Walla River near Milton Freewater, Oregon, to 185% on the Smilkameen River. May 1 reservoir storage is generally good, with reservoirs in the Yakima Basin at 117% of average and 87% of capacity.

## SNOWPACK:

Warm weather continued over Washington during April, causing further deterioration in the mountain snowpack. Statewide SNOTEL sites in Washington have a snowpack 45% of average for May 1, down from 62% last month. Maximum snow water content of 54.5 inches was measured at Lyman Lake SNOTEL in the Chelan Basin. This site would normally have 58.7 inches of water content on May 1. The Olympic and the Cowlitz - Lewis Basins set record minimums for the month. Snowpack varies over the state from 89% of normal in the Chelan Basin to 0% in the Elwah River area of the Olympic Basin, and several other watersheds around the state. Snowpack along the west slopes of the Cascade Mountains includes the Green River with 15%, the Lewis River 8% and the Skagit 72%. Snowpack in the Okanogan is at 47%, and the Yakima is at 46% of normal, down from 55% last month.

## **PRECIPITATION:**

April precipitation from National Weather Service stations was 149% of average state wide. The year-to-date precipitation statewide is 86%. It varied from 100% of normal in the Walla Walla Basin to 67% in the Okanogan Basin. April precipitation varied from 32% of average in the Okanogan Basin, to 192% in the Olympic Basin. SNOTEL sites in Washington showed high elevation year-to-date precipitation values to be 86%, up from 83% a month ago. Maximum year-to-date precipitation was at the June Lake SNOTEL site near Mt. St. Helens, with 112.4 inches since October 1, 1991. Normal for this site would be 134.6 inches.

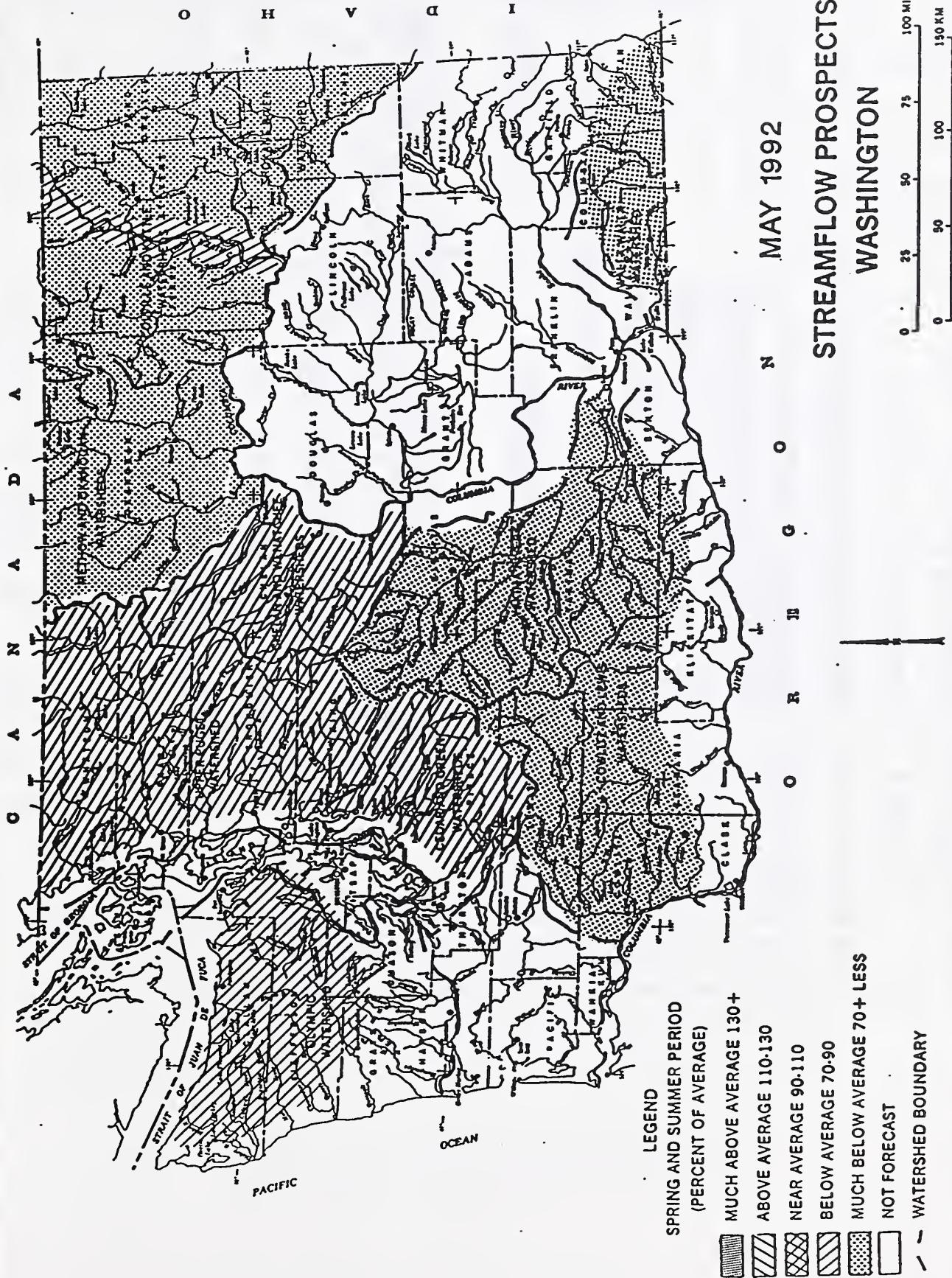
## **RESERVOIR:**

Reservoir storage in Washington is generally good for May 1. Reservoir storage in the Yakima Basin was 896,000 acre feet, 117% of normal. Storage at other reservoirs includes Roosevelt at 237% of average. Water is being held back for salmon flushing later in the year. The Okanogan reservoirs are at 103% of May 1 normal. The power generation reservoirs contain the following: Coeur d'Alene Lake, 227,300 acre feet, or 72% of normal; Chelan Lake, 262,400 acre feet, 58% of average and 39% of capacity, and Ross Lake at 827,600 acre feet and 128% of average, and 59% of capacity.

## **STREAMFLOW:**

Forecasts for summer streamflow are for below to much below average and vary from 87% of average for Skagit River to 29% of normal for Grande Ronde River in the Walla Walla River Basin. April forecasts for some west side streams include: Cedar River, 70% down from 73% last month; Skagit River, 87%; and the Dungeness River, 70%. Some east side streams include the Yakima River at Parker, 60%; the Okanogan River at Tonasket, 46% down from 61% last month; and the Colville River at 59%. April streamflows varied throughout Washington, with above normal flows in the north half of the state and below normal in the southern part. The Similkameen River was at 202% of normal, the highest in the state. The Columbia River, at Birchbank was at 125% and at The Dalles, it was 80%. Other streamflows were the following percent of normal: the Okanogan River, 136%; the Walla Walla River, which at 35% was the lowest in the state; the Spokane River, 48%; the Yakima at the Parker, 80%; the Wenatchee River at 124% and the Methow at 127%. The Cowlitz River was 79% of normal.





SOURCE: Data compiled by SCS  
Field Personnel

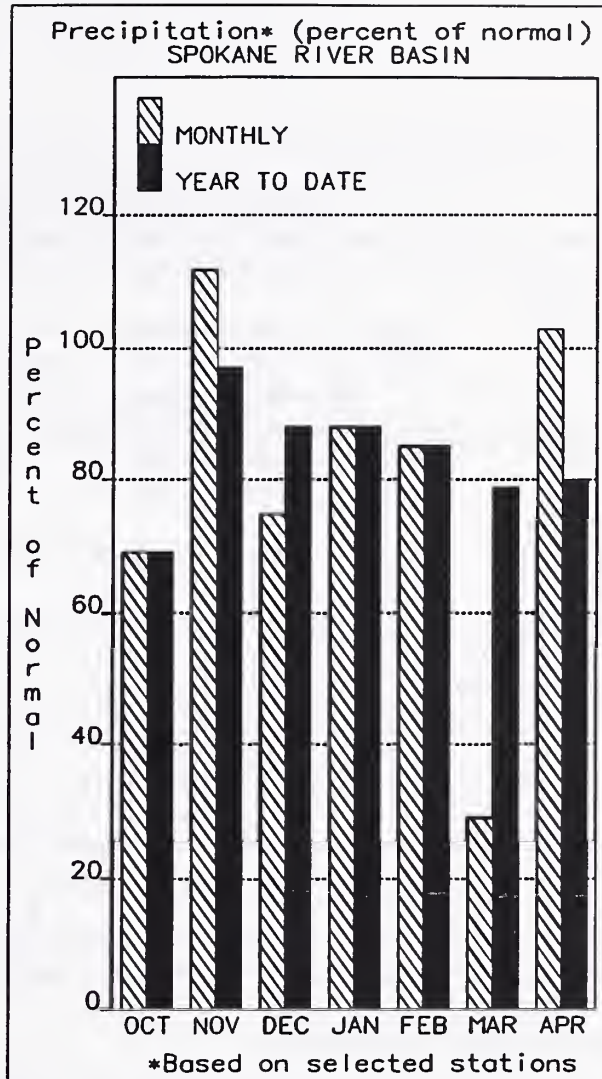
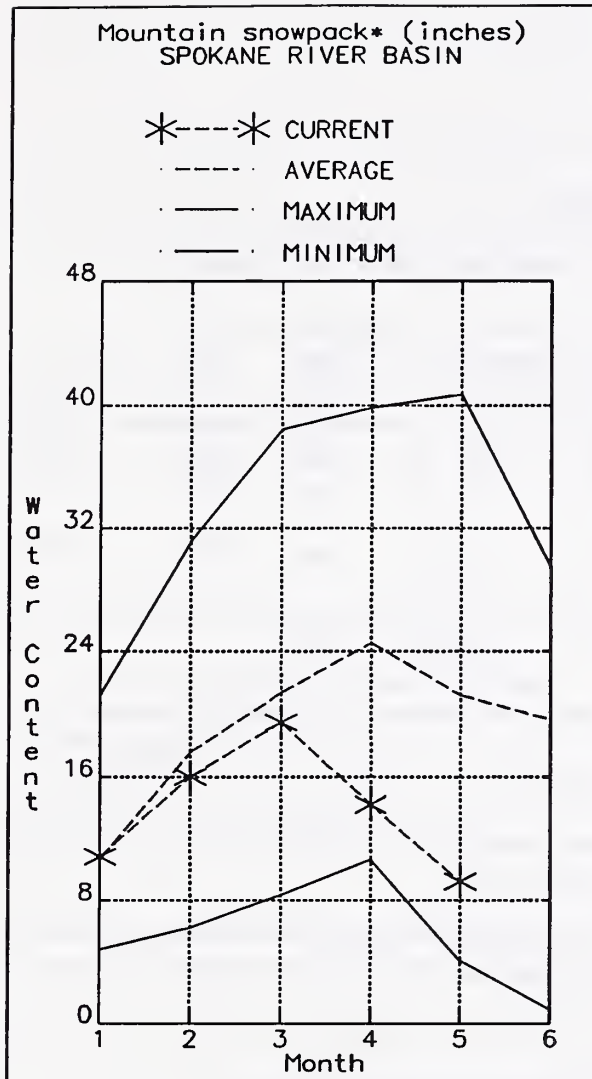


# BASIN SUMMARY OF SNOW COURSE DATA

## MAY 1992

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90	SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90	
PEND OREILLE RIVER							METHOW RIVER							
BENTON MEADOW	2370	5/01/92	0	.0	.0	.0	HARTS PASS	6500	5/01/92	65	29.8	59.9	45.1	
BENTON SPRING	4920	5/01/92	13	5.5	13.7	13.6	HARTS PASS	6500	5/01/92	---	33.45	82.8	42.0	
BOYER MOUNTAIN	5250	4/30/92	14	6.8	16.2	23.6	SALMON MOWS	4500	5/01/92	---	.05	.0	1.1	
BUNCHGRASS MEADOWS	5000	4/29/92	30	14.5	26.2	26.8	CHELAN LAKE BASIN							
BUNCHGRASS MOWPILLOW	5000	5/01/92	---	15.6	29.4	28.0	LYMAN LAKE	5900	5/01/92	---	54.55	95.2	58.7	
HOODOO BASIN	6050	5/01/92	---	34.6E	55.7	51.2	MINERS RIDGE	6200	5/01/92	---	38.85	77.1	---	
HOODOO CREEK	5900	5/01/92	---	29.2E	47.4	47.1	PARK CK RIDGE	4600	5/01/92	---	26.65	61.1	33.6	
LOOKOUT (d)	5140	5/01/92	---	15.4E	27.4	30.7	RAINY PASS	4780	5/01/92	69	33.6	53.0	40.6	
NELSON	CAN.	4/27/92	4	1.7	5.6	7.2	RAINY PASS	4780	5/01/92	---	34.05	63.5	36.8	
KETTLE RIVER							ENTIAI RIVER							
BARNES CREEK	CAN.	4/26/92	35	16.5	23.4	20.5	POPE RIDGE	PILLOW	3540	5/01/92	---	.05	.8	1.6
BIG WHITE MTH	CAN.	4/27/92	28	12.2	20.2	19.9	WENATCHEE RIVER							
CARM	CAN.	4/27/92	0	.0	1.2	1.7	BLEWETT PASS #2	PILLOW	4270	5/01/92	---	.05	2.1	4.9
FARRON	CAN.	4/29/92	2	.9	5.6	10.4	FISH LAKE	PILLOW	3370	5/01/92	---	2.25	22.8	25.0
GRAYSTOKE LAKE	CAN.	4/29/92	22	9.4	19.4	18.1	LYMAN LAKE	5900	5/01/92	---	54.55	95.2	58.7	
MONASHKE PASS	CAN.	4/26/92	17	7.4	14.1	12.8	STEVENS PASS	PILLOW	4070	5/01/92	---	4.35	43.2	32.1
TRAPPING CK LOW	CAN.	4/27/92	0	.0	.0	.0	TROUGH #2	PILLOW	5310	5/01/92	---	.05	.0	2.5
TRAPPING CK UP	CAN.	4/27/92	0	.0	1.6	5.6	UPPER WHEELER	PILLOW	4400	5/01/92	---	.05	4.0	4.8
SPOKANE RIVER							STENILT CREEK							
FOURTH OF JULY SUM	3200	4/29/92	0	.0	.0	.0	UPPER WHEELER	PILLOW	4400	5/01/92	---	.05	4.0	4.1
LOOKOUT (d)	5140	5/01/92	---	15.4E	27.4	30.7	COLOCKUM CREEK							
LOST LAKE	6110	5/01/92	---	39.3E	69.7	57.1	TROUGH #2	PILLOW	5310	5/01/92	---	.05	.0	2.5
MOSQUITO RIDGE	5200	5/01/92	---	19.1E	31.1	---	YAKIMA RIVER							
MOSQUITO	PILLOW	5/01/92	---	18.9	31.9	34.7	BLEWETT PASS #2	PILLOW	4270	5/01/92	---	.05	2.1	4.9
SUNSET	5540	5/01/92	---	14.0E	34.7	---	BUMPING RIDGE	PILLOW	4600	5/01/92	---	8.45	21.8	18.9
SUNSET	PILLOW	5/01/92	---	16.0	38.8	36.5	CORRAL PASS	PILLOW	6000	5/01/92	---	27.75	40.1	29.5
NEWMAN LAKE							FISH LAKE							
QUARTZ PEAK	PILLOW	4700	5/01/92	---	.0	15.3	GREEN LAKE	PILLOW	6000	5/01/92	---	11.85	18.2	19.7
OKANOGAN RIVER							GROUSE CAMP							
ABERDEEN LAKE	CAN.	4300	5/01/92	0	.0	1.0	MORSE LAKE	PILLOW	5400	5/01/92	---	31.55	63.5	44.4
BLACKHALL PEAK	CAN.	6370	5/01/92	---	22.8	---	OLALLIE MOWS	PILLOW	3960	5/01/92	---	19.35	50.9	51.0
BRENDA MINE	CAN.	4800	4/27/92	7	3.5	9.8	SASSE RIDGE	PILLOW	4200	5/01/92	---	11.75	25.2	24.1
BROOKHIRE	CAN.	3200	4/28/92	0	.0	5.0	STAMPEDE PASS	PILLOW	3860	5/01/92	---	14.45	39.7	39.1
ENDERBY	CAN.	6200	4/30/92	70	27.6	48.1	WHITE PASS ES	PILLOW	4500	5/01/92	---	4.55	18.6	18.7
ESPERON CK. UP	CAN.	5410	4/27/92	22	9.3	---	ANTANUM CREEK							
ESPERON CK. MID	CAN.	4690	4/27/92	13	5.0	11.2	GREEN LAKE	PILLOW	6000	5/01/92	---	11.85	18.2	19.7
ESPERON CK. LO	CAN.	4400	4/27/92	2	.4	---	MILL CREEK							
FREEZEOUT CK. TRAIL	3500	5/01/92	0	.0	12.0	7.0	HIGH RIDGE	PILLOW	4980	5/01/92	---	.05	11.5	12.4
GREYBACK RES	CAN.	5120	4/28/92	2	.7	10.2	TOUCHET #2	PILLOW	5530	5/01/92	---	4.2	21.8	27.3
HAMILTON HILL	CAN.	4890	4/29/92	0	.0	17.4	LEWIS - COWLITZ RIVERS							
HARTS PASS	6500	5/01/92	65	29.8	59.9	45.1	JUNE LAKE	PILLOW	3200	5/01/92	---	.05	12.0	19.6
HARTS PASS	PILLOW	6500	5/01/92	---	33.45	82.8	LOWE PINE	PILLOW	3800	5/01/92	---	.05	21.2	26.4
ISMOK LAKE	CAN.	5500	4/28/92	0	.0	9.7	PARADISE PARK	PILLOW	5500	5/01/92	---	51.45	81.8	61.8
LIGHTNING LAKE	CAN.	4000	4/29/92	6	2.0	18.8	PIGTAIL PEAK	PILLOW	5900	5/01/92	---	40.85	66.3	47.7
LOST HORSE MTH	CAN.	6300	5/04/92	7	2.5	17.7	POTATO HILL	PILLOW	4500	5/01/92	---	.05	19.8	17.0
MOCULLOCH	CAN.	4200	4/30/92	0	.0	.9	SHEEP CANYON	PILLOW	4050	5/01/92	---	.05	29.5	34.7
MISSISSAUA MTH	CAN.	5090	4/29/92	0	.0	5.4	SPENCER MOW	PILLOW	3400	5/01/92	---	.05	9.8	17.2
MISSION CREEK	CAN.	5800	4/29/92	36	15.6	25.1	SPIRIT LAKE	PILLOW	3100	5/01/92	---	.05	.0	.3
MONASHKE PASS	CAN.	4500	4/26/92	17	7.4	14.1	SURPRISE LKS	PILLOW	4250	5/01/92	---	8.05	33.6	36.1
MT. KOBAY	CAN.	5900	4/26/92	24	8.9	10.1	WHITE PASS ES	PILLOW	4500	5/01/92	---	4.55	18.6	18.7
OTAH LAKE	CAN.	4400	4/30/92	0	.0	3.9	WHITE RIVER							
POSTILL LAKE	CAN.	4500	5/01/92	0	.0	6.0	CORRAL PASS	PILLOW	6000	5/01/92	---	27.75	40.1	29.5
SALMON MOWS	PILLOW	4500	5/01/92	---	.05	.0	MORSE LAKE	PILLOW	5400	5/01/92	---	31.55	63.5	44.4
SILVER STAR MTH	CAN.	6000	4/26/92	46	21.1	30.8	GREEN RIVER							
SUNMERLAND RES	CAN.	4200	4/28/92	0	.0	5.7	COUGAR MTH.	PILLOW	3200	5/01/92	---	.05	14.1	9.3
SUNDAY SUNSET	CAN.	4300	4/29/92	0	.0	.9	GRASS MOUNTAIN #2	PILLOW	2900	4/28/92	0	.0	.0	2.3
TROUT CREEK	CAN.	4690	4/26/92	0	.0	5.4	LESTER CREEK	PILLOW	3100	4/28/92	0	.0	15.2	15.0
VASEUX CREEK	CAN.	4600	4/29/92	0	.0	4.6	LYNN LAKE	PILLOW	4000	4/28/92	0	.0	25.7	10.7
WHITE ROCKS MTH	CAN.	6000	4/29/92	20	9.7	20.5	SAMHILL RIDGE	PILLOW	4700	4/28/92	2	.8	25.7	28.2
SKAGIT RIVER							STAMPEDE PASS							
BEAVER CREEK TRAIL	2200	5/01/92	12	5.3	.0	4.1	TWIN CAMP	PILLOW	3860	5/01/92	---	14.45	39.7	39.1
BROWN TOP	AM	6000	5/01/92	87	41.6	91.5	THIN CAMP	PILLOW	4100	4/28/92	0	.0	20.2	---
DEVILS PARK	5900	5/01/92	68	31.2	68.6	45.0	SHOQUALMIE RIVER							
FREEZEOUT CK. TRAIL	3500	5/01/92	0	.0	12.0	7.0	KROMONA MINE	PILLOW	2400	5/01/92	0	.0	14.8	23.4
HARTS PASS	6500	5/01/92	65	29.8	59.9	45.1	OLALLIE MOWS	PILLOW	3960	5/01/92	---	19.35	50.9	51.0
HARTS PASS	PILLOW	6500	5/01/92	---	33.45	82.8	OLNEY PASS	PILLOW	3250	5/01/92	0	.0	5.1	16.6
KIESILWA	CAN.	3710	5/03/92	0	.0	10.2	SKYKONISH RIVER							
LIGHTNING LAKE	CAN.	4000	4/29/92	6	2.0	18.8	STAMPEDE PASS	PILLOW	3860	5/01/92	---	14.45	39.7	39.1
LYMAN LAKE	PILLOW	5900	5/01/92	---	54.55	95.2	STEVENS PASS	PILLOW	4070	5/01/92	---	4.35	43.2	32.1
MEADOWS CABIN	1900	5/01/92	0	.0	.0	1.1								
NEW MOZONEEN LAKE	2800	5/01/92	0	.0	.0	4.5								
RAINY PASS	4780	5/01/92	69	33.6	53.0	40.6								
RAINY PASS	PILLOW	4780	5/01/92	---	34.05	63.5								
THUNDER BASIN	4200	5/01/92	24	11.2	23.4	21.8								
ELWA RIVER														
HURRICANE	4500	4/25/92	0	.0	12.2	21.9								
MORSE CREEK														
COX VALLEY	4500	4/26/92	39	18.7	34.0	39.1								
DUNGENESS RIVER														
DEER PARK	5200	4/27/92	2	.9	14.8	18.7								
QUILCENE RIVER														
MOUNT CRAG	PILLOW	4050	5/01/92	---	.05	14.2								





## SPOKANE RIVER BASIN



May 1, 1992: The May 1 forecasts for summer runoff within the Spokane River Basin are 53% of normal, down from 56% for last month. The forecast is based on a snowpack that is 44% of average and a water year-to-date precipitation value 80% of normal. Precipitation for April was 103% of average. Temperatures in the basin were three degrees above normal during April. Streamflow on the Spokane River was 48% of normal for April. May 1 storage in Coeur d'Alene Lake was 227,300 acre feet, 72% of normal.

For more information contact your local  
Soil Conservation Service office.

SPOKANE RIVER BASIN  
Streamflow Forecasts - May 1, 1992

		<<===== Drier ===== Future Conditions ===== Wetter =====>>							
Forecast Point	Forecast Period	===== Chance Of Exceeding * =====							
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)	
SPOKANE nr Post Falls (1,2)	MAY-SEP	440	940	1130	62	1320	1820	1836	
	MAY-JUL	495	895	1080	62	1260	1670	1743	
SPOKANE at Long Lake (2)	MAY-JUL	590	865	1050	53	1240	1510	1976	

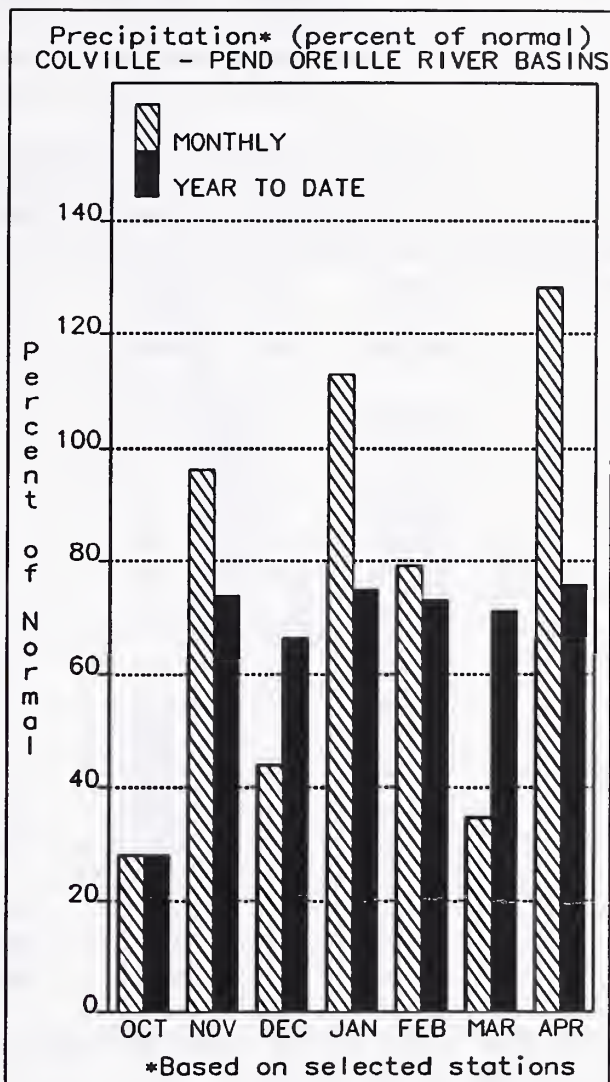
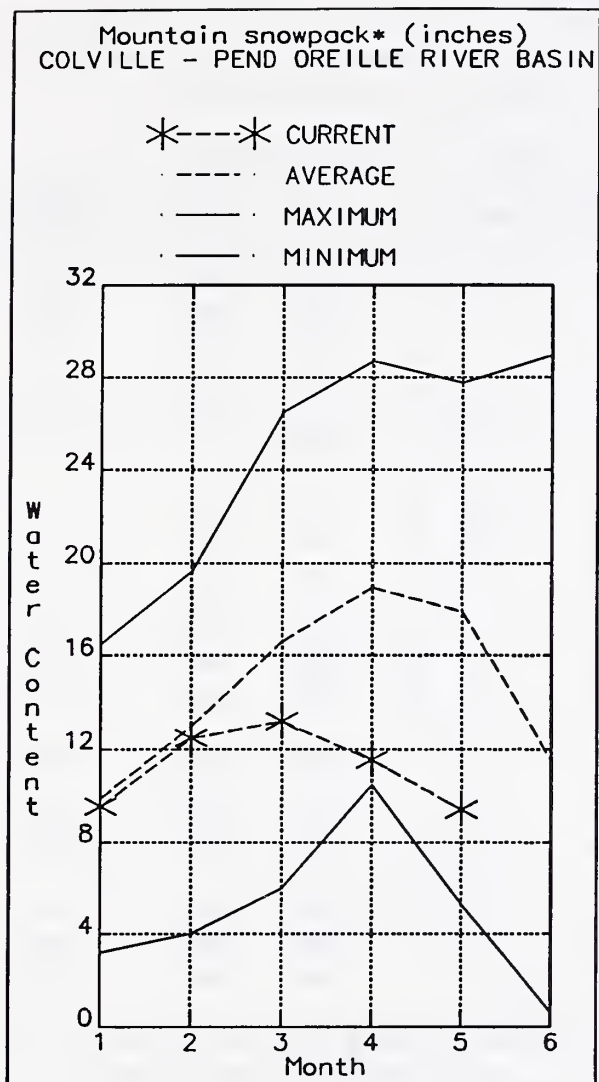
SPOKANE RIVER BASIN Reservoir Storage (1000 AF) - End of April					SPOKANE RIVER BASIN Watershed Snowpack Analysis - May 1, 1992			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
COEUR D'ALENE	291.2	227.3	277.2	317.2	Spokane River	9	45	44

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

(2) - The value is natural flow - actual flow may be affected by upstream water management.



#### COLVILLE - PEND OREILLE RIVER BASINS:



May 1, 1992: May 1 snow cover is 54% of average on the Pend Oreille and 52% on the Kettle. Snowpack at Bunchgrass Meadow SNOTEL site was 15.6 inches of water. The average May 1 reading is 29.1 inches. Precipitation during April was 128% of average, bringing the water year-to-date to 76% of normal. April streamflow was 79% of normal on the Pend Oreille River, 125% on the Columbia at the International Boundary, and 114% on the Kettle River. The forecast for the Kettle River streamflow is 60% of normal, the Pend Oreille, 55% down from 60% last month, and the Colville River, 59%, down from 72% of normal for the summer runoff period. Temperatures were two degrees above normal for April.

For more information contact your local  
Soil Conservation Service office.



COLVILLE - PEND OREILLE RIVER BASINS  
Streamflow Forecasts - May 1, 1992

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)
		===== Chance Of Exceeding * =====						
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	
=====								
PEND OREILLE bl Box Canyon (1,2)	MAY-SEP	4180	6030	6870	55	7710	9560	12430
	MAY-JUL	3710	5390	6150	55	6910	8590	11220
	MAY-JUN	3150	4550	5180	55	5810	7210	9410
CHAMOKANE CK nr Long Lake	MAY-AUG	1.1	3.9	5.9	63	7.9	10.7	9.4
	JUL-AUG	1.6	1.9	2.0	61	2.1	2.4	3.3
COLVILLE at Kettle Falls	MAY-SEP	26	40	49	58	59	73	84
	MAY-JUL	21	34	43	59	52	65	73
	MAY-JUN	18.0	30	38	59	46	58	64
KETTLE nr Laurier	MAY-SEP	655	830	950	60	1070	1240	1582
	MAY-JUL	615	780	890	60	1000	1170	1489
	MAY-JUN	545	690	790	60	890	1030	1314
COLUMBIA at Birchbank (1,2)	MAY-SEP	30800	33700	35000	86	36300	39200	40760
	MAY-JUL	24000	26300	27300	85	28300	30600	32090
	MAY-JUN	16900	18500	19200	85	19900	21500	22620
COLUMBIA at Grand Coulee Dm (1,2)	MAY-SEP	37500	41700	43600	75	45500	49700	57850
	MAY-JUL	30500	33900	35500	75	37100	40500	47570
	MAY-JUN	23200	25700	26900	75	28100	30600	35800

COLVILLE - PEND OREILLE RIVER BASINS  
Reservoir Storage (1000 AF) - End of April

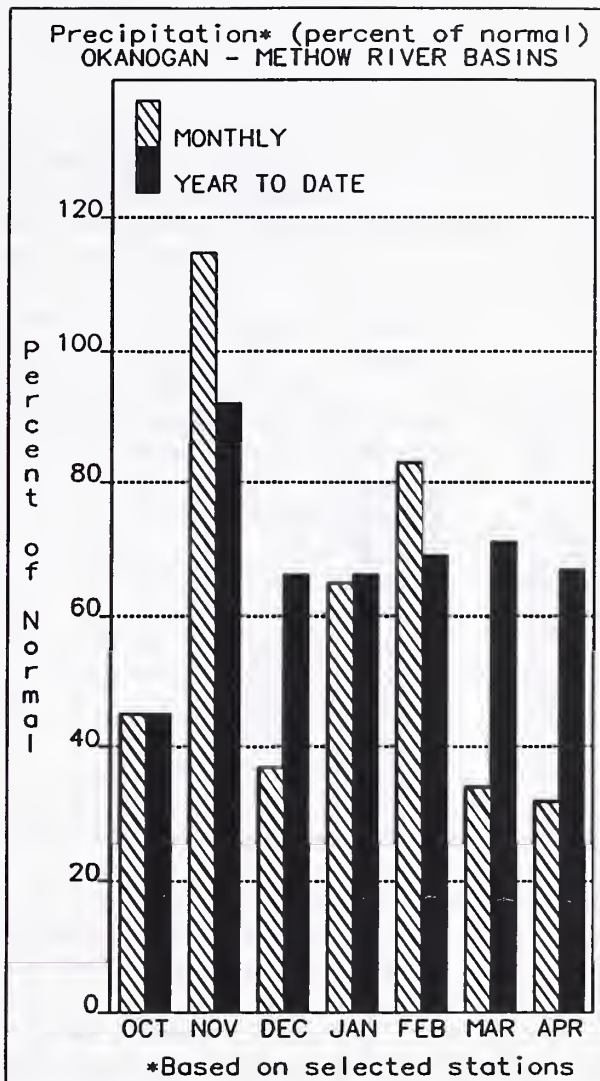
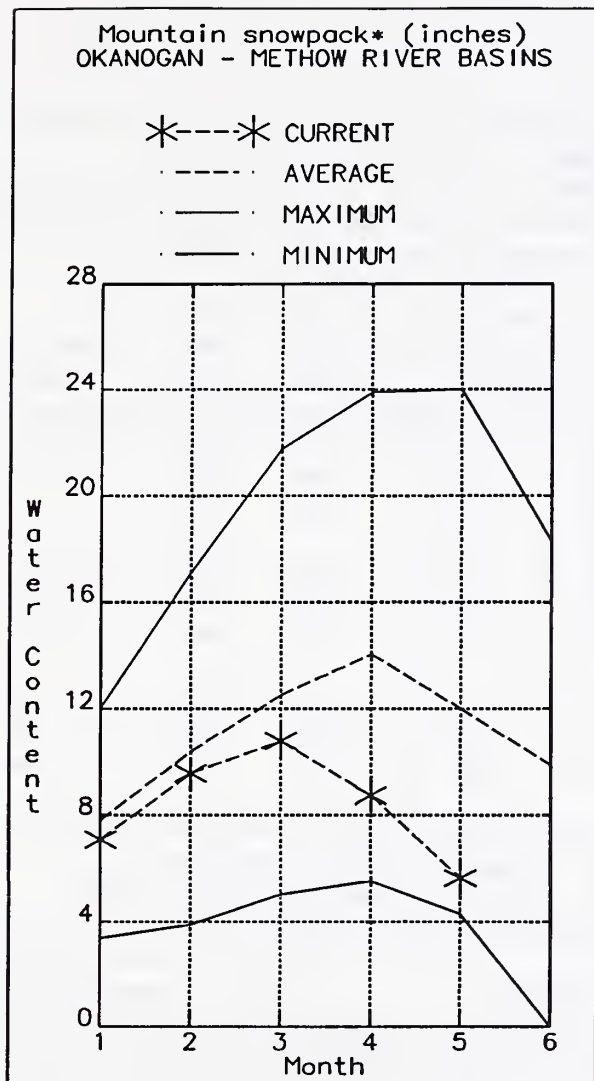
COLVILLE - PEND OREILLE RIVER BASINS  
Watershed Snowpack Analysis - May 1, 1992

Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
ROOSEVELT	5232.0	3101.7	698.1	1310.0	Colville River	0	0	0
BANKS	715.0	664.3	636.0	435.0	Pend Oreille River	8	56	54
					Kettle River	8	54	52

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
 (2) - The value is natural flow - actual flow may be affected by upstream water management.



#### OKANOGAN - METHOW RIVER BASINS: 💧

May 1, 1992: Summer runoff forecast for the Okanogan River is 46% of normal, down from 61%; the Similkameen River, 46%, and the Methow River, 68% of normal, down from 72%. Temperatures were three degrees above normal for the month. May 1 snow cover was 47% of average for the Okanogan, and 77% for the Methow Basin. April precipitation in the Okanogan-Methow was 32% of normal, with water year-to-date at 67% of average. April streamflow on the Methow River was 127% of normal, 136% on the Okanogan River, and 185% on the Similkameen River, the highest in the state. Snow water content at the Harts Pass SNOTEL, elevation 6500 feet, was 33.4 inches. Storage in the Conconully Reservoirs is 16,500 acre feet, which is 68% of capacity and 103% of May 1 average.

For more information contact your local  
Soil Conservation Service office.

OKANOGAN - METHOW RIVER BASINS  
Streamflow Forecasts - May 1, 1992

		<<===== Drier ===== Future Conditions ===== Wetter =====>>							
Forecast Point	Forecast Period	Chance Of Exceeding *							30-Yr Avg. (1000AF)
		90%	70%	50% (Most Probable)		30%	10%		
		(1000AF)	(1000AF)	(1000AF)	(% AVG.)	(1000AF)	(1000AF)		
SIMILKAMEEN nr Nighthawk (1)	MAY-SEP	455	520	595	46	670	935	1300	
	MAY-JUL	340	490	555	46	620	770	1205	
	MAY-JUN	260	400	465	46	530	670	1014	
OKANOGAN RIVER nr Tonasket (1)	MAY-SEP	225	515	680	46	845	1290	1485	
	MAY-JUL	140	465	610	46	755	1080	1328	
	MAY-JUN	133	385	500	46	615	865	1095	
METHOW RIVER nr Pateros (1)	MAY-SEP	375	515	580	68	645	785	854	
	MAY-JUL	355	480	540	69	600	725	786	
	MAY-JUN	285	405	460	70	515	635	659	

OKANOGAN - METHOW RIVER BASINS  
Reservoir Storage (1000 AF) - End of April

OKANOGAN - METHOW RIVER BASINS  
Watershed Snowpack Analysis - May 1, 1992

Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
CONCONULLY LAKE (SALMON)	10.5	8.3	9.8	8.0	Okanogan River	26	36	45
CONCONULLY RESERVOIR	13.0	8.2	9.5	8.0	Methow River	2	40	77

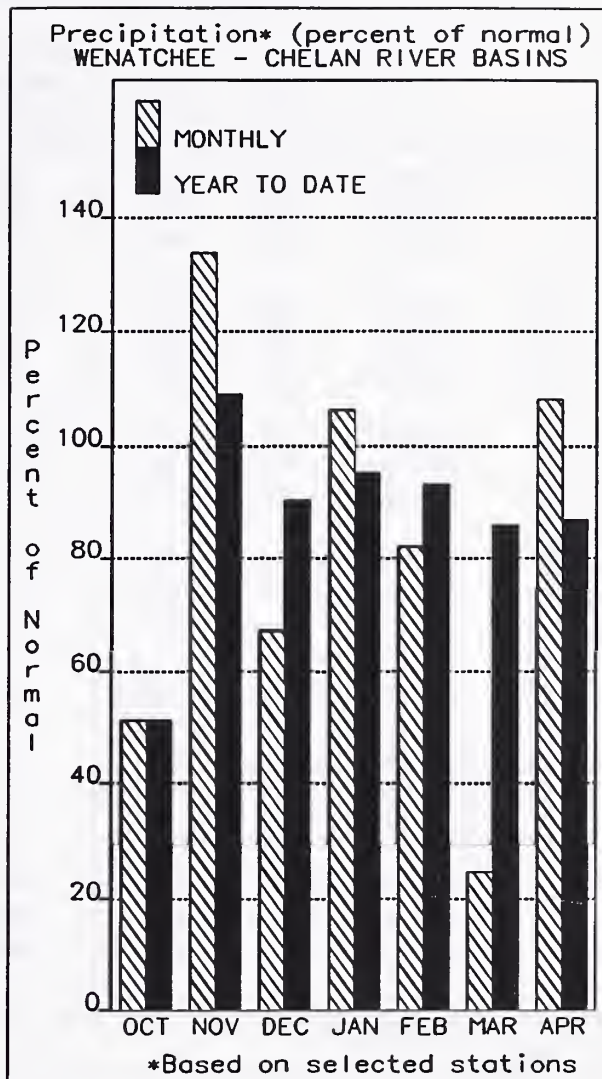
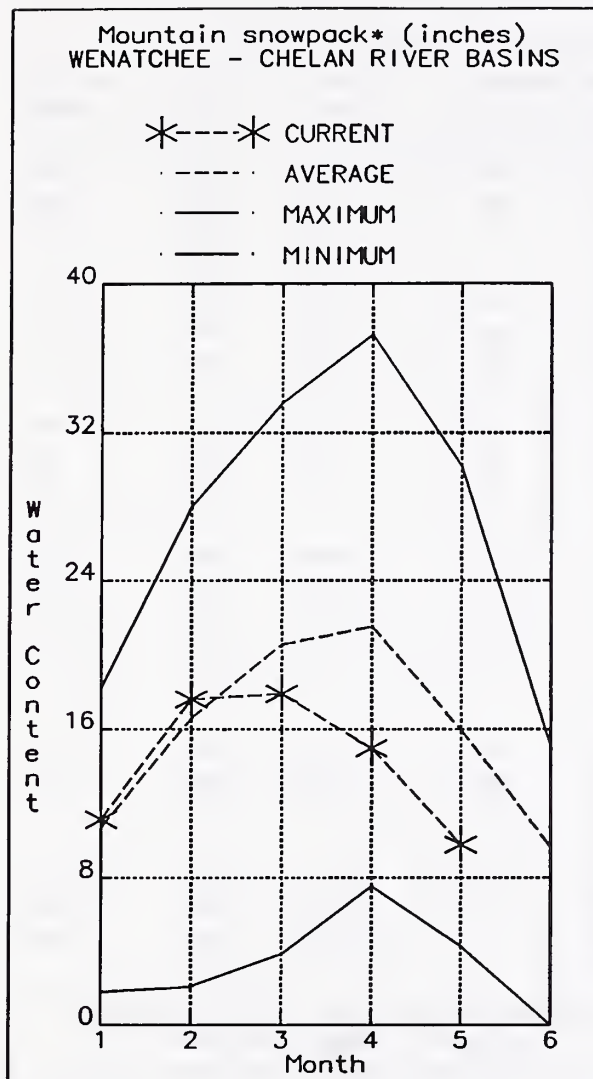
\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

(2) - The value is natural flow - actual flow may be affected by upstream water management.





#### WENATCHEE - CHELAN RIVER BASINS:

May 1, 1992: May 1 snowpack in the Wenatchee Basin is 50%; the Chelan Basin 89%. The Entiat, Stimilt and Squilchuck show no snow. Reservoir storage in Lake Chelan is 262,400 acre feet or 58% of May 1 average and 39% of capacity. Lyman Lake SNOTEL had the most snow water with 54.5 inches of water; this site would normally have 67.5 inches. Runoff for the Entiat River is forecast to be 82% of normal for the summer. Summer forecasts for the Chelan River are for 75%, Wenatchee River's runoff 80%, and 76% on the Squilchuck-Stemilt. Icicle Creek is forecast to be 78% of normal. Streamflow for April on the Chelan River was 127% of average and the Wenatchee River was 124% of normal. Precipitation during April was 111% of normal in the basin and 87% for the year-to-date.

For more information contact your local  
Soil Conservation Service office.

WENATCHEE - CHELAN RIVER BASINS  
Streamflow Forecasts - May 1, 1992

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)
		===== Chance Of Exceeding * =====						
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
CHELAN RIVER at Chelan (1)	MAY-SEP	605	720	785	75	850	970	1041
	MAY-JUL	500	625	680	75	735	860	905
	MAY-JUN	385	475	520	75	565	655	693
STEHEKIN R. at Stehekin	MAY-SEP	450	570	600	80	630	750	751
	MAY-JUL	435	475	500	80	525	565	625
	MAY-JUN	325	350	370	80	390	415	462
ENTIAT RIVER nr Ardenvoir	MAY-SEP	138	157	170	82	183	200	208
	MAY-JUL	126	143	155	82	167	184	188
	MAY-JUN	102	116	125	83	134	148	150
WENATCHEE R. at Peshastin	MAY-SEP	610	905	1100	77	1300	1590	1428
	MAY-JUL	545	805	980	77	1160	1410	1277
	MAY-JUN	435	635	770	77	905	1110	997
STEMILT nr Wenatchee (miners in)	MAY-SEP	60	87	105	76	123	150	138
ICICLE CREEK nr Leavenworth	APR-SEP	169	240	290	78	340	410	370
	APR-JUL	154	220	265	78	310	375	340
	APR-JUN	122	174	210	78	245	300	270
COLUMBIA R. bl Rock Island Dam (2)	MAY-SEP	40100	44300	47200	75	50100	54300	62910
	MAY-JUL	32700	36200	38600	74	41000	44500	52190
	MAY-JUN	25200	27800	29600	75	31400	34000	39480

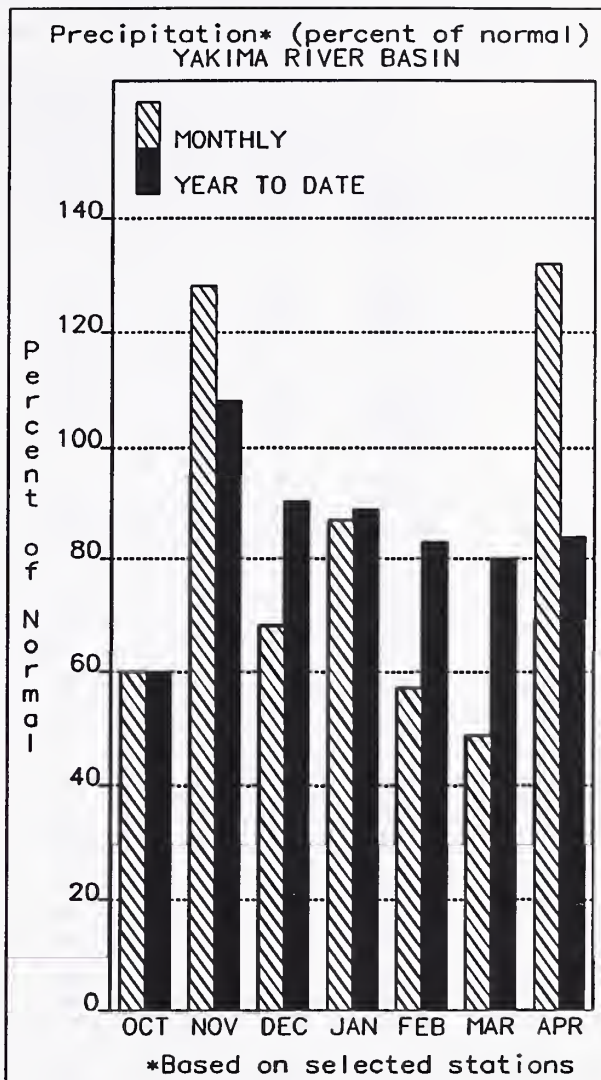
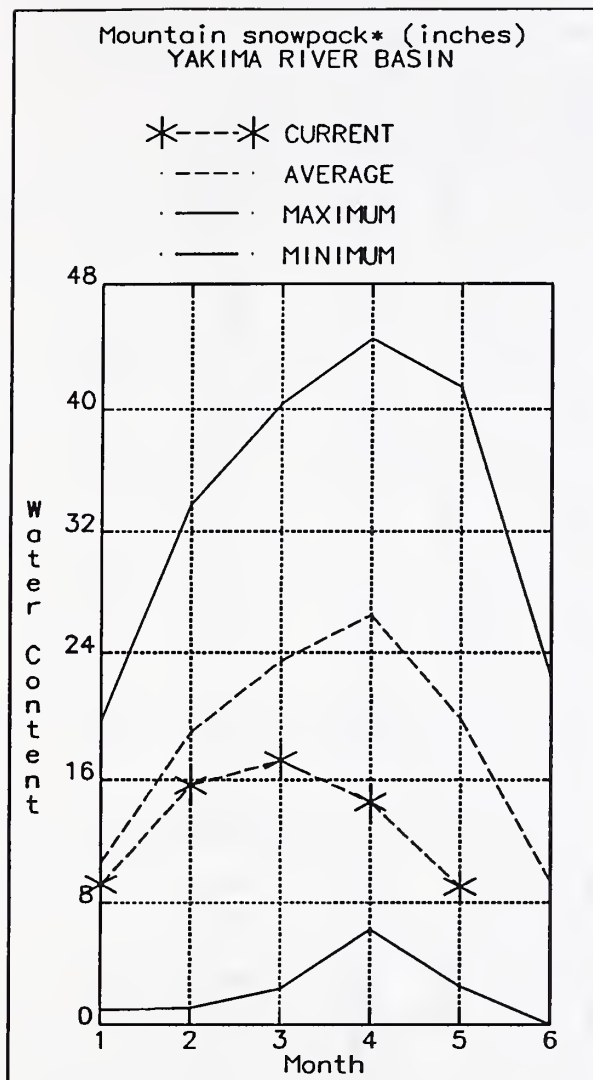
WENATCHEE - CHELAN RIVER BASINS Reservoir Storage (1000 AF) - End of April					WENATCHEE - CHELAN RIVER BASINS Watershed Snowpack Analysis - May 1, 1992			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of =====	
		This Year	Last Year	Avg			Last Yr	Average
CHELAN LAKE	676.1	262.4	396.8	448.8	Chelan Lake Basin	3	52	89
					Entiat River	1	0	0
					Wenatchee River	5	37	50
					Squilchuck Creek	0	0	0
					Stemilt Creek	1	0	0
					Colockum Creek	1	0	0

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

(2) - The value is natural flow - actual flow may be affected by upstream water management.



#### YAKIMA RIVER BASIN:

May 1, 1992: May precipitation was 135% of normal and 84% for the water year-to-date. The outlook for irrigation water for the summer is fair with May 1 reservoir storage for the five major reservoirs at 930,400 acre feet, 119% of average. May 1 snowpack is 46% based upon 11 snow courses and SNOTEL readings. May 1 summer streamflow forecasts for the Yakima Basin vary throughout the basin as follows: the Yakima River at Cle Elum, 63%; Naches River, 62%; the Yakima River near Parker, 60%, Ahtanum Creek, 66%; and Tieton River 65%. April streamflows varied with the Yakima River at Parker 80% of normal, 93% on the Yakima near Cle Elum, and 92% on the Naches River. Temperatures were one degree above average for April. Volume forecasts for the Yakima Basin are for natural flow. As such, they may differ from the U. S. Bureau of Reclamation's forecast for the total water supply available which includes adjustments for reservoir operation and irrigation return flow.

For more information contact your local  
Soil Conservation Service office.



YAKIMA RIVER BASIN  
Streamflow Forecasts - May 1, 1992

		<<===== Drier ===== Future Conditions ===== Wetter =====>>						
Forecast Point	Forecast Period	Chance Of Exceeding *						30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	
YAKIMA RIVER at Martin (1)	MAY-SEP	57	57	70	65	75	82	107
	MAY-JUL	47	57	62	65	67	77	96
	MAY-JUN	40	49	53	65	57	66	81
YAKIMA RIVER at Cle Elum (2)	MAY-SEP	375	425	465	63	505	555	740
	MAY-JUL	325	380	415	63	450	505	657
	MAY-JUN	270	315	345	63	375	420	546
YAKIMA RIVER nr Parker (2)	MAY-SEP	615	820	950	60	1080	1310	1580
	MAY-JUL	560	725	835	60	945	1110	1390
	MAY-JUN	475	615	710	60	805	945	1182
KACHESS RIVER nr Easton (1)	MAY-SEP	50	55	61	66	67	74	92
	MAY-JUL	41	52	57	66	62	73	86
	MAY-JUN	35	45	49	66	53	63	74
CLE ELUM RIVER nr Roslyn (1)	MAY-SEP	197	220	240	63	260	285	378
	MAY-JUL	161	198	215	63	230	270	340
	MAY-JUN	130	161	175	63	189	220	276
BUMPING RIVER nr Nile (1)	MAY-SEP	54	71	78	66	85	103	118
	MAY-JUL	49	64	71	66	78	93	107
	MAY-JUN	40	52	57	66	62	74	87
AMERICAN RIVER nr Nile	MAY-SEP	55	63	68	67	73	81	102
	MAY-JUL	50	57	62	67	67	74	92
	MAY-JUN	41	46	50	67	54	59	75
TIETON RIVER at Tieton (1)	MAY-SEP	92	119	133	65	147	177	204
	MAY-JUL	73	98	109	65	120	145	167
	MAY-JUN	55	74	83	65	92	111	128
WACHES RIVER nr Waches (2)	MAY-SEP	270	385	425	62	465	585	687
	MAY-JUL	290	345	380	62	415	470	610
	MAY-JUN	240	285	315	62	345	390	506
ANTANUM CREEK nr Tampo (2)	MAY-SEP	16.0	22	25	66	28	34	38
	MAY-JUL	14.0	19.0	22	65	25	30	34
	MAY-JUN	11.7	15.4	18.0	64	21	24	28

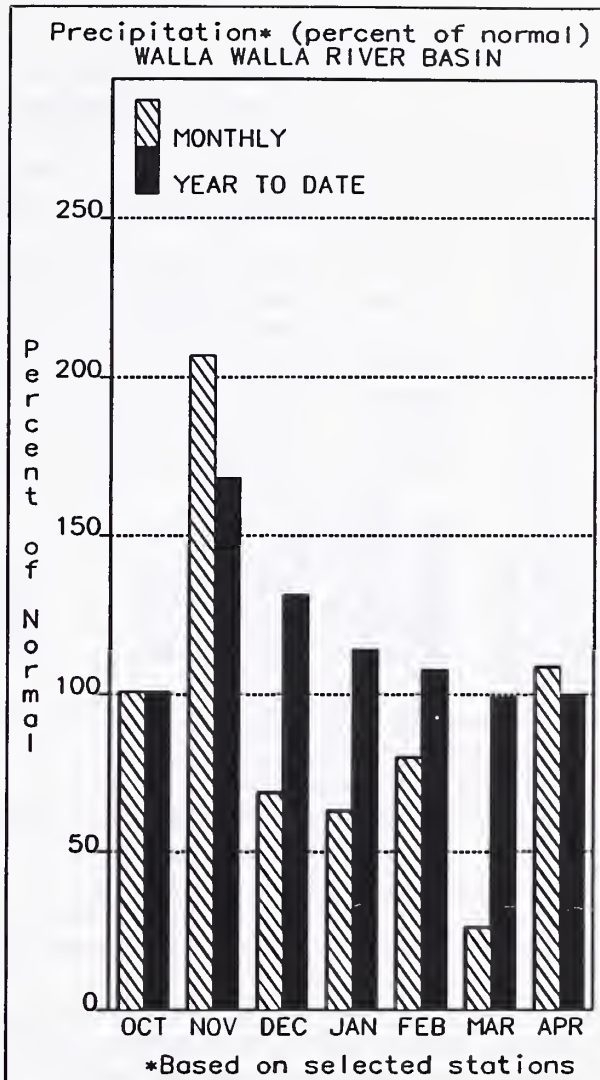
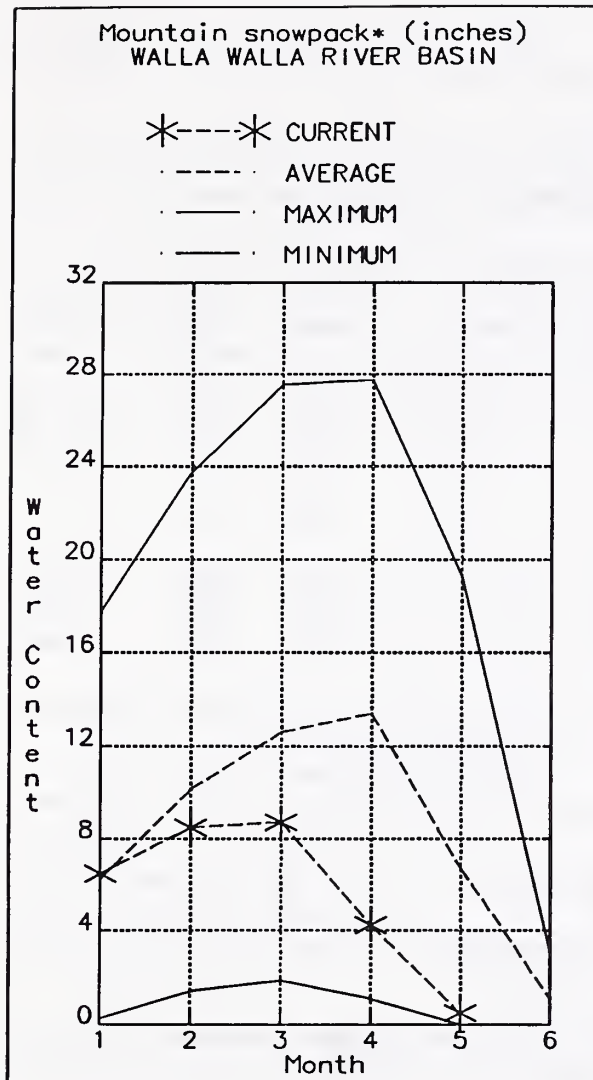
YAKIMA RIVER BASIN Reservoir Storage (1000 AF) - End of April					YAKIMA RIVER BASIN Watershed Snowpack Analysis - May 1, 1992			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
KEECHULUS	157.8	129.2	139.3	119.0	Yakima River	11	43	46
KACHESS	239.0	211.1	225.8	197.0	Ahtanum Creek	1	65	60
CLE ELUM	436.9	404.8	406.2	308.0				
BUMPING LAKE	33.7	34.4	25.6	15.0				
RIMROCK	198.0	150.9	176.4	144.0				

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

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#### WALLA WALLA RIVER BASIN:



May 1, 1992: April precipitation was 109% of average, bringing the water year-to-date precipitation to 100% of normal. The forecast is for 55% of average streamflow in the Walla Walla River for the coming summer, the Grande Ronde, 29%, the lowest in the state; Snake River, 42%, and 41% for Mill Creek. April streamflow was 35% of normal on the Walla Walla River, 57% for the Snake River and the Grande Ronde River near Troy. May 1 snowpack is at 7%, down from 30% last month. Temperatures were three degrees above average for April.

For more information contact your local  
Soil Conservation Service office.

WALLA WALLA RIVER BASIN  
Streamflow Forecasts - May 1, 1992

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>						30-Yr Avg. (1000AF)
		===== Chance Of Exceeding * =====						
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	
MILL CREEK at Walla Walla	MAY-SEP	0.1	1.8	3.1	41	4.4	6.3	7.5
	MAY-JUL	0.1	1.9	3.2	44	4.5	6.4	7.3
	MAY-JUN	0.1	1.9	3.1	44	4.3	6.1	7.1
SF WALLA WALLA nr Milton Freewater	MAY-JUL	14.4	17.7	20	54	22	26	37
COLUMBIA R. at The Dalles (2)	MAY-SEP	41800	48700	53300	62	57900	64800	85560
	MAY-JUL	34100	39800	43700	61	47600	53300	71360
	MAY-JUN	26500	30900	33900	61	36900	41300	55540

WALLA WALLA RIVER BASIN  
Reservoir Storage (1000 AF) - End of April

WALLA WALLA RIVER BASIN  
Watershed Snowpack Analysis - May 1, 1992

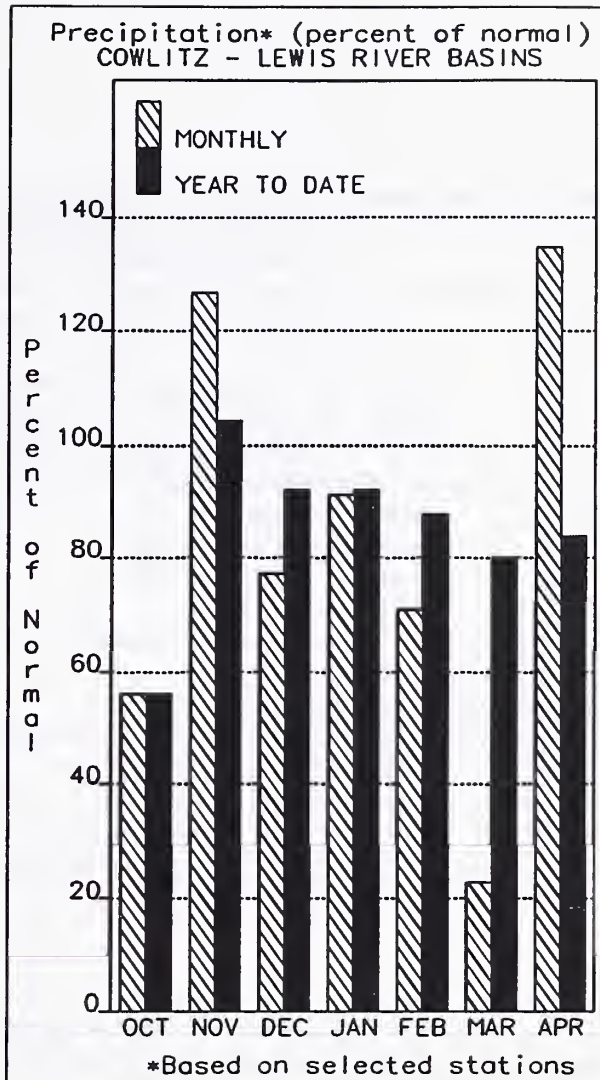
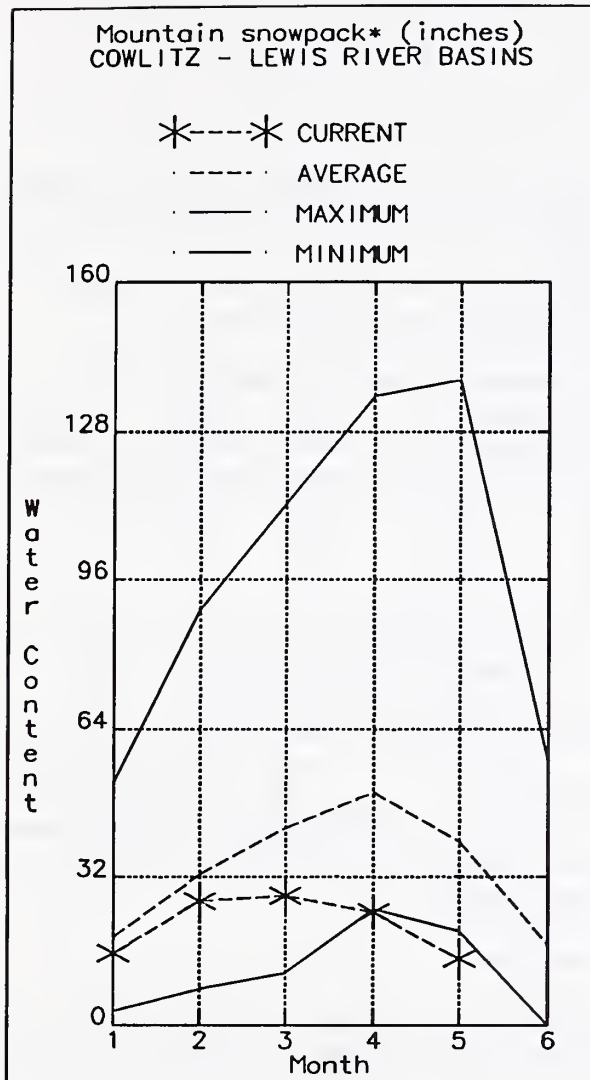
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					Mill Creek	2	13	11

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
 (2) - The value is natural flow - actual flow may be affected by upstream water management.





#### COWLITZ - LEWIS RIVER BASINS:

May 1, 1992: April precipitation was 135% of normal, bringing the water year-to-date precipitation to 84% of average. May 1 snow cover for the Cowlitz-Lewis River Basin is 37%, down from 49% last month. The Paradise Park SNOTEL contained the largest water content for the basin with 51.4 inches of water. Normal May 1 water content is 73.3 inches. Forecasts for summer runoff in the Lewis River are 63%, and for the Cowlitz River, 65%. April streamflow on the Cowlitz River was 79% of average, and 68% on the Lewis River. Temperatures were three degrees above normal for April.

For more information contact your local  
Soil Conservation Service office.

COWLITZ - LEWIS RIVER BASINS  
Streamflow Forecasts - May 1, 1992

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)
		Chance Of Exceeding *						
		90% (1000AF)	70% (1000AF)	50 (Most Probable) (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	
LEWIS RIVER at Ariel (2)	MAY-SEP	320	445	530 63		615	745	848
	MAY-JUL	255	360	430 62		500	605	696
	MAY-JUN	215	300	360 62		420	505	578

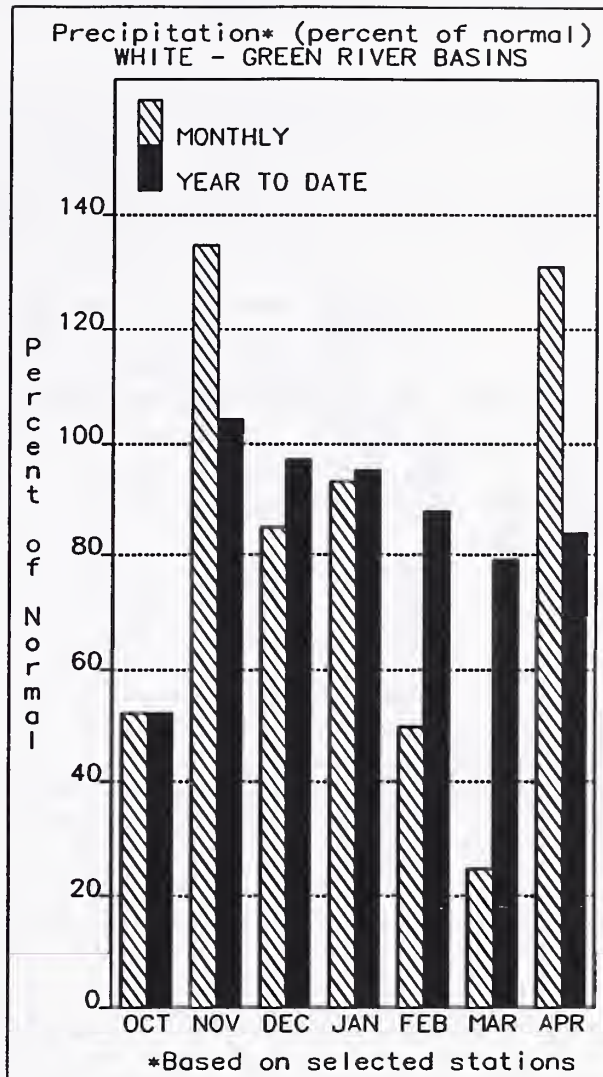
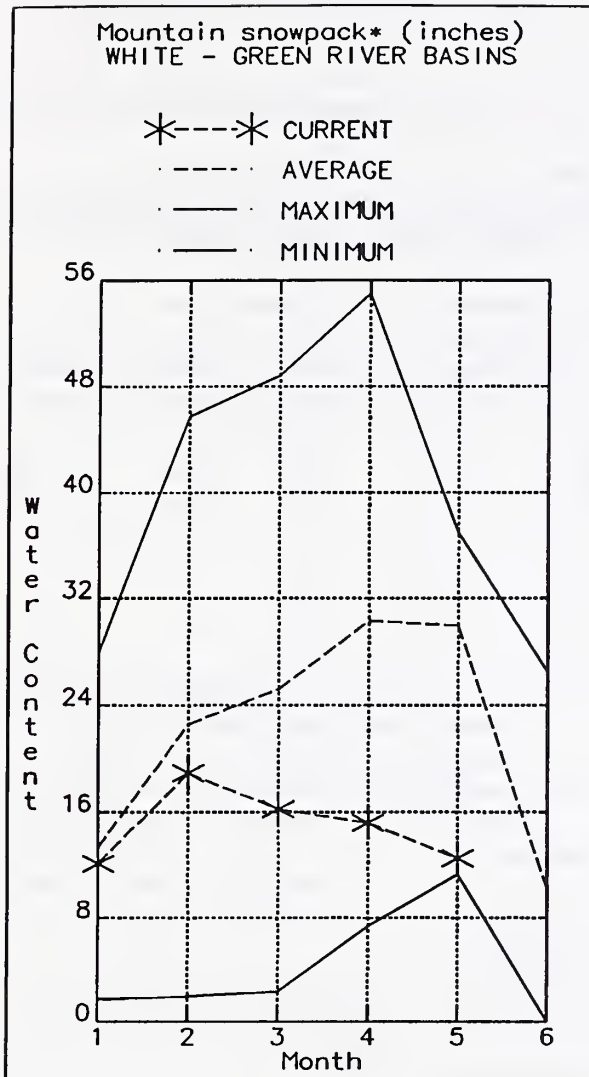
COWLITZ - LEWIS RIVER BASINS Reservoir Storage (1000 AF) - End of April					COWLITZ - LEWIS RIVER BASINS Watershed Snowpack Analysis - May 1, 1992			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					Cowlitz River	6	45	54
					Lewis River	4	10	8

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

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(2) - The value is natural flow - actual flow may be affected by upstream water management.



#### WHITE - GREEN RIVER BASINS: ♀

May 1, 1992: Low water supplies are foreseen by the City of Seattle for the coming summer, with water rationing already in effect. Summer runoff is forecasted to be 78% on the Green River and 70% on the Cedar River. May 1 snowpack was 80% of normal in the White River and 15% in the Green River. Water content on May 1 at the Stampede Pass SNOTEL, at an elevation of 3860 feet, was 14.4 inches. This site has a May 1 average of 38.7 inches. April precipitation was 131% of normal, bringing the water year-to-date to 84% of average. Temperatures were four degrees above average for April.

For more information contact your local  
Soil Conservation Service office.



WHITE - GREEN RIVER BASINS  
Streamflow Forecasts - May 1, 1992

Forecast Point		Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>						30-Yr Avg. (1000AF)
			===== Chance Of Exceeding * =====						
			90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	
GREEN R bl Howard Hanson Dam (2)		MAY-SEP	120	141	155	78	169	190	198
		MAY-JUL	105	123	135	79	147	165	170
		MAY-JUN	89	105	115	78	125	141	147
CEDAR RIVER nr Cedar Falls		MAY-SEP	33	40	45	70	50	58	64
		MAY-JUL	29	36	40	71	45	51	56
		MAY-JUN	25	30	34	72	38	43	47

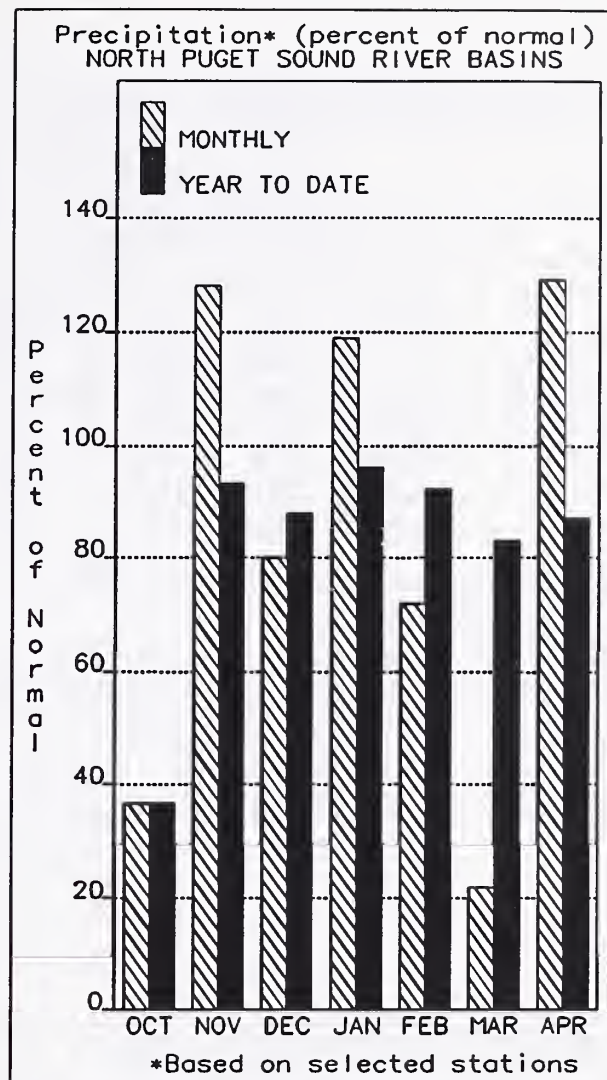
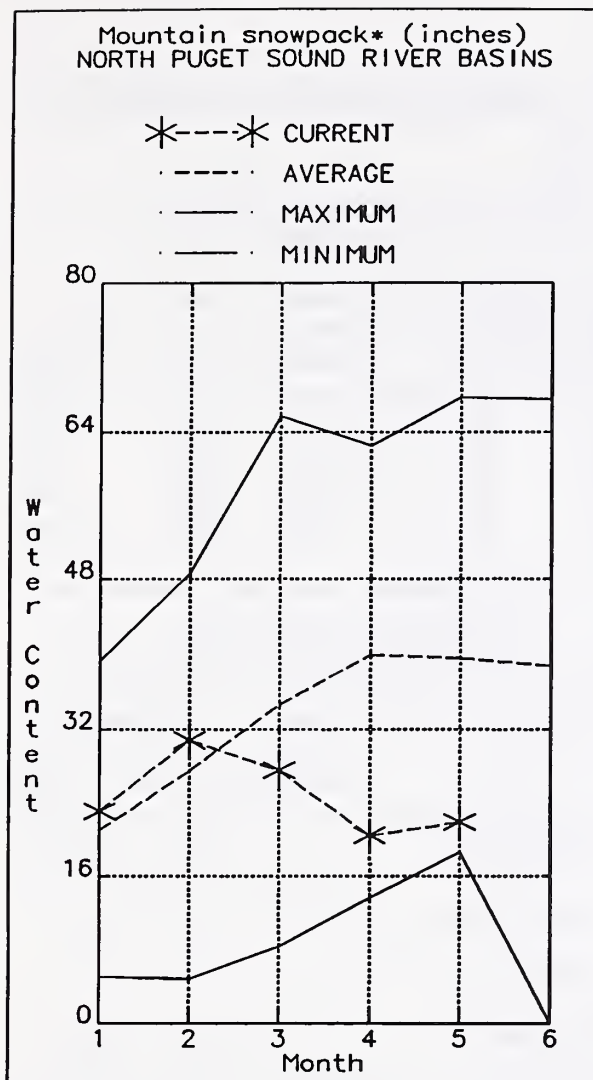
WHITE - GREEN RIVER BASINS Reservoir Storage (1000 AF) - End of April					WHITE - GREEN RIVER BASINS Watershed Snowpack Analysis - May 1, 1992			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					White River	2	57	80
					Green River	6	13	15
					Cedar River	0	0	0

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

(2) - The value is natural flow - actual flow may be affected by upstream water management.



#### NORTH PUGET SOUND RIVER BASINS:

May 1, 1992: Forecast for the Skagit River streamflow is 87% of normal for the spring and summer period. This forecast is down from 87% from last month. April streamflow in the Skagit River was 105% of average. May 1 snow cover in the Skagit Basin is 55% of normal. Rainy Pass SNOTEL at elevation 4780 feet, has 34.0 inches of water content; normal May 1 water content is 36.8 inches. May 1 reservoir storage is above average, with Ross Lake Reservoir at 128% of normal and 59% of capacity. Precipitation for April was 129% of average with a water year-to-date at 87% of normal. April temperatures were four degrees above normal.

For more information contact your local  
Soil Conservation Service office.

NORTH PUGET SOUND RIVER BASINS  
Streamflow Forecasts - May 1, 1992

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)
		===== Chance Of Exceeding * =====						
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	
=====		=====		=====		=====		=====
SKAGIT RIVER at Newhalem (2)	MAY-SEP	1390	1580	1700	87	1820	2010	1963
	MAY-AUG	1310	1480	1600	88	1720	1890	1826
	MAY-JUL	1170	1320	1420	88	1520	1670	1608
	MAY-JUN	840	970	1060	89	1150	1280	1188

NORTH PUGET SOUND RIVER BASINS Reservoir Storage (1000 AF) - End of April					NORTH PUGET SOUND RIVER BASINS Watershed Snowpack Analysis - May 1, 1992			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
ROSS	1404.1	827.6	602.5	644.4	Snoqualmie River	3	27	21
DIABLO RESERVOIR	90.6	86.6	85.7	---	Skykomish River	2	23	26
GORGE RESERVOIR	NO REPORT				Skagit River	12	46	70
					Baker River	0	0	0

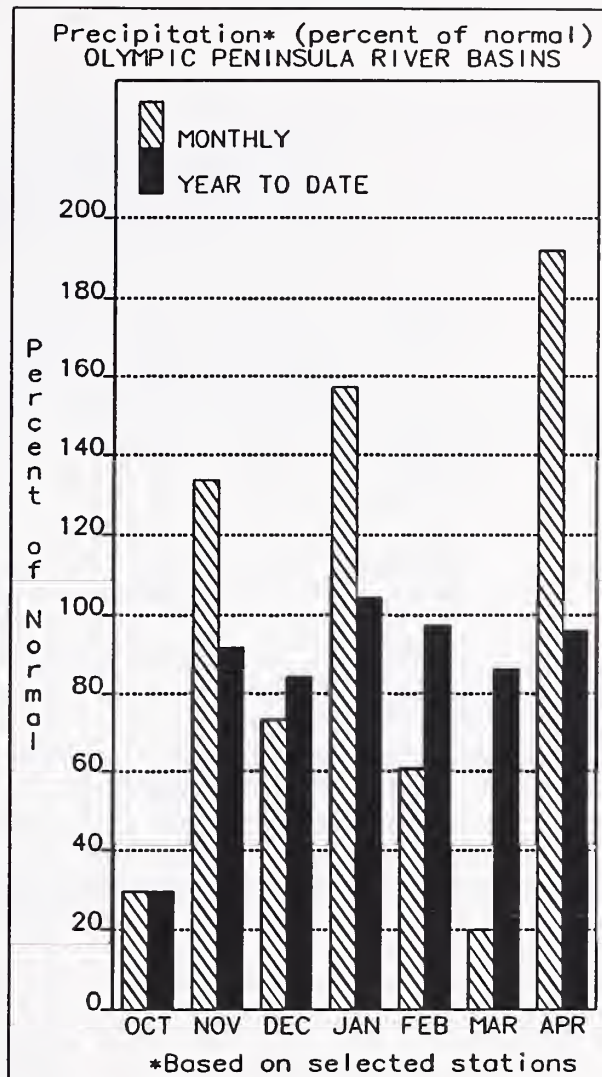
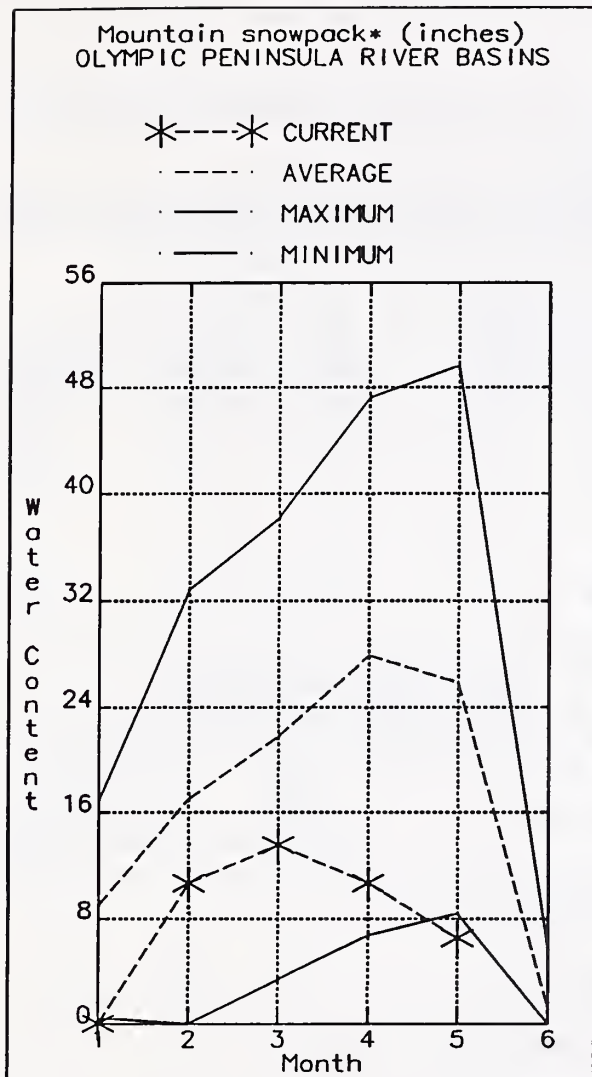
\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

(2) - The value is natural flow - actual flow may be affected by upstream water management.





#### OLYMPIC PENINSULA RIVER BASINS:



May 1, 1992: April precipitation was 192% of average, with water year-to-date precipitation accumulation at 96% of normal. May 1 snow cover in the Olympic Basin is below normal with the Elwah River at 0%, the Dungeness River at 5% and Morse Creek at 48%. May forecasts for streamflow in the basin are for 70% of average on the Dungeness and Elwha Rivers. The Big Quilcene can expect much below normal runoff this summer. The Mount Crag SNOTEL near Quilcene no water content on May 1, last year it had 14.2 inches. Temperatures were three degrees above normal for April.

For more information contact your local  
Soil Conservation Service office.

OLYMPIC PENINSULA RIVER BASINS  
Streamflow Forecasts - May 1, 1992

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)
		===== Chance Of Exceeding * =====						
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	
		=====				=====		
DUNGENESS RIVER nr Sequim	MAY-SEP	75	89	98	70	107	121	140
	MAY-JUL	61	72	79	71	86	97	112
	MAY-JUN	41	50	57	72	64	73	79
ELWHA RIVER nr Port Angeles	MAY-SEP	225	270	300	70	330	375	427
	MAY-JUL	179	215	240	70	265	300	342

OLYMPIC PENINSULA RIVER BASINS Reservoir Storage (1000 AF) - End of April					OLYMPIC PENINSULA RIVER BASINS Watershed Snowpack Analysis - May 1, 1992			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					Elwha River	1	0	0
					Morse Creek	1	55	48
					Dungeness River	1	6	5
					Quilcene River	0	0	0
					Wynoochee River	0	0	0

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
 (2) - The value is natural flow - actual flow may be affected by upstream water management.





